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Technical Paper 107

DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
JOSEPH A. HOLMES, DIRECTOR

PRODUCTION OF EXPLOSIVES IN THE UNITED STATES

DURING THE CALENDAR YEAR 1914

WITH NOTES ON COAL MINE ACCIDENTS DUE TO EXPLOSIVES

COMPILED BY

ALBERT H. FAY

U. S. Bureau of Mines

WASHINGTON
GOVERNMENT PRINTING OFFICE
1915

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PRODUCTION AND DISTRIBUTION OF EXPLOSIVES IN THE UNITED STATES DURING THE CALENDAR YEAR 1914, AND COAL-MINE ACCIDENTS DUE TO EXPLOSIVES.

Compiled by ALBERT H. FAY.

INTRODUCTION.

The total production of explosives, excluding the amount exported, in the United States during the calendar year 1914, according to figures that the Bureau of Mines has received from manufacturers, was 450,251,489 pounds (225,126 short tons), as compared with 500,015,845 pounds (250,008 short tons) in 1913 and 489,393,131 pounds (244,696 short tons) in 1912.

The production for 1914 is segregated as follows: Black powder, 206,099,700 pounds; "high" explosives other than permissible explosives, 218,453,971 pounds; and permissible explosives, 25,697,818 pounds. These figures represent a decrease of 23,839,831 pounds of black powder; 23,932,573 pounds of high explosives, and 1,987,952 pounds of permissible explosives as compared with figures for 1913.

As explosives are essential to mining and the use of improved types of explosives tends to lessen the dangers attending this industry, the Bureau of Mines has undertaken the compilation of information showing the total amount of explosives manufactured and used in the United States, its first report, Technical Paper 69, dealing with the year 1912, and the second, Technical Paper 85, with the year 1913. The report for 1914 is therefore the third paper of the series.

CLASSIFICATION OF EXPLOSIVES.

The production figures tabulated herein are classified as follows:

1. *Black blasting powder.*—All black powder with sodium or potassium nitrate as a constituent is here classified as black blasting powder.

2. *High explosives.*—Dynamite and all other high explosives of various trade names and compositions, except permissible explosives, are put in this class.

3. *Permissible explosives.*—In this class are included ammonium nitrate explosives, hydrated explosives, organic nitrate explosives, and certain nitroglycerin explosives containing an excess of free

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water or carbon. All permissible explosives have passed certain tests of the Bureau of Mines, and are not to be regarded as permissible unless used in the manner specified by the bureau.[a]

ACKNOWLEDGMENTS.

The Bureau of Mines takes this opportunity to express its appreciation of the aid rendered by the manufacturers in furnishing the data compiled, and to Mr. C. C. Quincy, secretary of the Institute of the Makers of Explosives.

SCOPE OF STATISTICS.

Table 1 shows, for the calendar years 1912, 1913, and 1914, the quantity of explosives used in those States wherein three or more manufacturers reported sales. States in which only one or two manufacturers reported sales were not segregated.

Tables 2, 3, and 4 give the total production and uses, by groups of States, of black powder, high explosives, and permissible explosives, respectively. The States are so grouped as to include regions where the general conditions of mining are more or less similar and yet to avoid publishing sales of individual companies.

Table 5 shows the rapid increase in the production and sale of permissible explosives. In 1902 only 11,300 pounds of permissible explosives were used in coal mining, whereas in 1913 the quantity so used had risen to 21,804,285 pounds, falling to 19,593,892 pounds in 1914. The decrease in the total amount of permissible explosives used in coal mining in 1914 is about 10 per cent as compared with 1913, and is in harmony with the smaller production of coal.

The quantity of permissible explosives used in the United States is larger than in a number of foreign countries. In 1912 it represented about 5 per cent of the total quantity of explosives produced and in 1914, 5.7 per cent. The total amount of explosives used for the production of coal in 1914 was 220,622,487 pounds, of which about 8.9 per cent was of the permissible class as compared with 9.5 per cent in 1913.

Table 6 gives the quantities of permissible explosives used for mining coal in the various coal fields. The table shows that in 1914 about four-fifths of the permissible explosives manufactured were used for coal mining, the remaining 6,103,926 pounds being reported under the items "Other mining" and "All other purposes," as shown in Table 4.

[a] Hall, Clarence, Snelling, W. O., and Howell, S. P., Investigations of explosives used in coal mines, with a chapter on the natural gas used at Pittsburgh, by G. A. Burrell, and an introduction by C. E. Munroe: Bull. 15, Bureau of Mines, 1912, 197 pp.
Hall, Clarence, and Howell, S. P.: Tests of permissible explosives: Bull. 66, Bureau of Mines, 1913, 313 pp.

The figures for 1914 tabulated in this paper represent the reports of 41 manufacturers who operated their plants during the year. The number of manufacturers reporting sales of black powder was 29, of high explosives 29, and of permissible explosives 19. A number of other companies reported their plants as having been idle during the year or as having been sold to other manufacturers.

The reports of manufacturers of fireworks and of ammunition are not included, inasmuch as the majority of these manufacturers purchase their explosives from one or more of the manufacturers of explosives.

MINE ACCIDENTS DUE TO EXPLOSIVES.

Table 7 shows the number of fatalities due to the use of explosives in the coal mines for the years 1912, 1913, and 1914.

Table 8 shows, for the periods indicated, that 3,661 men have been killed in the coal mines since the beginning of inspection service in the various States. The fatalities shown in this table are classified in 14 groups, from which it appears that nearly 18 per cent of the fatalities occurred during the handling and transportation of explosives and approximately 25 per cent may be grouped as due to premature blasts and short fuse.

In this table some of the causes overlap slightly. For example, "Returned too soon," "Flying pieces of rock or coal," "Delayed blast," and "Suffocation by powder gases," might all properly be classified as "Returned too soon." However, in compiling the table the statement made by the inspector in his report on the fatality has been taken as the guide for classification. Of fatal accidents from flying pieces of coal or rock, some may have been due to the miner returning too soon and others to the miner not getting far enough away or not having proper shelter near the working face.

It will be noted that comparatively few fatalities at coal mines are caused by thawing of explosives, and still fewer to unexploded charges in coal and débris. The total number of fatalities due to shots breaking through pillar or rib is 220.

The fatalities caused by explosives at metal mines were 78 for 1911, 94 for 1912, and 89 for 1913. The fatalities at quarries for the same years were 50, 47, and 44, respectively.

The use of permissible explosives in coal mining has unquestionably resulted in lessening risks, and few, if any, of the serious mine disasters can be attributed directly to their use.

PRODUCTION AND DISTRIBUTION OF EXPLOSIVES—COAL-MINE FATALITIES.

The production and use of explosives in the United States are given in detail in Tables 1 to 6 following. Statistics on fatalities in coal mines from their use are given in Tables 7 and 8.

TABLE 1.—*Amount of explosives (excluding exports) manufactured in the United States and used in the various States during the calendar years 1912, 1913, and 1914.*

[Figures for 1913 revised from statement in Technical Paper 85, Bureau of Mines.]

State.	1912			1913			1914		
	Black blasting powder.	High explosives other than permissible.	Permissible explosives.	Black blasting powder.	High explosives other than permissible.	Permissible explosives.	Black blasting powder.	High explosives other than permissible.	Permissible explosives.
	Kegs.	*Pounds.*	*Pounds.*	*Kegs.*	*Pounds.*	*Pounds.*	*Kegs.*	*Pounds.*	*Pounds.*
Alabama	211,095	4,542,192	3,856,130	204,151	5,573,850	4,396,667	178,689	3,921,685	3,171,697
Alaska	(a)	(a)	(a)	(a)	3,571,470		(a)	(a)	
Arizona	(a)	(a)	(a)	30,550	8,731,355		9,346	7,986,113	(a)
Arkansas	111,072	1,109,946	(a)	107,679	1,240,465	4,300	88,363	1,137,869	(a)
California	(a)	(a)	(a)	182,974	12,048,102	(a)	110,418	10,344,833	(a)
Colorado	106,732	7,268,790	656,858	82,542	7,760,290	684,687	82,472	7,165,230	812,550
Connecticut	36,853	677,759	5,600	2,994	710,518	(a)	1,888	751,265	(a)
Delaware	(a)	79,426		(a)	(a)	(a)	(a)	(a)	
District of Columbia		(a)		(a)	(a)			15,250	
Florida	3,678	1,770,182	(a)	1,518	2,187,268		991	1,935,619	
Georgia	27,797	1,238,907	(a)	23,524	1,178,770		16,706	785,471	(a)
Idaho	11,848	3,749,470	(a)	11,502	3,995,415	(a)	6,566	3,676,450	
Illinois	1,466,972	5,879,767	746,094	1,294,282	6,680,690	1,578,925	1,205,636	6,260,121	1,344,375
Indiana	500,141	2,634,435	(a)	543,212	2,452,364	81,750	508,226	2,619,206	90,623
Iowa	347,335	1,439,367	(a)	310,206	1,921,721	(a)	346,910	1,846,192	27,650
Kansas	450,502	2,417,112	63,350	466,244	3,293,798	32,275	503,688	3,105,531	(a)
Kentucky	257,406	2,629,495	292,933	279,964	3,087,345	467,550	302,772	2,258,712	550,600
Louisiana	(a)	877,813	(a)	(a)	1,146,162	(a)	(a)	822,974	(a)
Maine	6,289	666,305		6,693	831,484	(a)	3,907	755,895	
Maryland	26,048	1,248,727	14,450	37,966	1,475,214	(a)	23,422	1,476,686	11,450
Massachusetts	5,066	1,579,630	(a)	8,636	1,497,992	(a)	6,561	1,432,825	(a)
Michigan	21,769	23,694,970	(a)	25,148	21,818,795	(a)	34,371	20,812,133	(a)
Minnesota	221,989	10,647,442	(a)	(a)	11,105,635		140,834	9,072,006	(a)
Mississippi	522	521,245		4,572	693,523	(a)	2,213	745,630	
Missouri	173,309	17,202,890		172,866	15,712,677	(a)	156,118	13,962,593	324,100
Montana	132,242	(a)	(a)	109,969	8,751,955	(a)	86,397	6,842,101	(a)
Nebraska	6,099	217,310		4,713	263,450	(a)	4,001	219,110	
Nevada	(a)	(a)	(a)	(a)	6,836,785	(a)	16,179	5,792,895	(a)
New Hampshire	2,047	296,503		644	172,550		1,026	156,050	(a)
New Jersey	(a)	1,976,054	(a)	4,477	2,175,336	(a)	6,347	2,187,358	(a)
New Mexico	47,130	1,798,225	(a)	45,662	1,955,230	(a)	58,516	1,874,677	(a)
New York	37,015	14,474,767	196,375	38,802	12,519,410	(a)	31,313	10,050,483	(a)
North Carolina	25,133	1,358,702	(a)	32,480	1,670,475	10,000	11,270	1,952,940	(a)
North Dakota	13,160	197,275	(a)	11,578	287,600	(a)	12,950	291,394	(a)
Ohio	302,628	6,639,698	36,550	347,374	7,272,123	20,600	246,727	8,815,955	30,775
Oklahoma	207,689	1,687,862	350,200	182,927	2,134,864	354,800	187,935	2,209,729	387,455
Oregon	(a)	4,070,160		(a)	4,538,430		29,000	4,578,205	(a)
Pennsylvania	2,887,996	32,059,187	8,108,612	2,843,343	36,532,915	9,836,050	2,720,550	34,808,704	9,208,600
Rhode Island	(a)	197,350	(a)	341	81,075		(a)	52,800	
South Carolina	(a)	340,327		(a)	483,030		449	287,445	
South Dakota	4,180	1,756,515		(a)	1,937,305		5,497	2,032,826	
Tennessee	186,268	3,824,012	198,790	203,035	4,575,107	226,337	126,035	3,380,283	124,938
Texas	81,031	1,750,382	27,131	69,105	1,681,600	(a)	53,459	1,226,391	(a)
Utah	62,073	4,385,460	(a)	136,098	5,721,925	3,963,700	21,519	3,297,570	(a)
Vermont	13,602	270,250		11,790	331,450		10,004	213,025	
Virginia	156,189	3,012,704	134,900	182,740	3,502,263	160,650	124,293	3,261,091	510,450
Washington	(a)	7,117,330	(a)	60,077	8,610,471	(a)	(a)	8,093,036	(a)
West Virginia	505,926	4,323,135	3,072,095	668,884	4,534,400	3,498,460	611,817	4,122,230	3,236,099
Wisconsin	10,012	5,303,415	143,150	5,528	5,876,207	(a)	6,775	5,972,077	13,029
Wyoming	123,131	199,275	95,700	105,824	461,735	258,650	102,435	449,407	229,550
Not segregated	421,650	45,247,664	6,631,352	274,967	87,940	2,110,369	39,391	3,326,900	5,623,877
Total	[b] 9,211,735	234,469,492	24,630,270	[b] 9,197,581	242,386,544	27,685,770	[b] 8,243,988	218,453,971	25,697,818
	[c] 230,293,309			[c] 229,939,531			[c] 206,099,700		
Grand total (pounds)	489,393,131			500,015,845			450,251,489		

[a] Represents the product of only one or two manufacturers, and is included in item "Not segregated," at bottom of column.
[b] Kegs of 25 pounds each.
[c] Pounds.

TABLE 2.—*Amount of* ***black blasting powder*** *used in the United States during 1913 and 1914, classified by use.*

[Kegs of 25 pounds each.]

Groups of States.	Black blasting powder, 1913.				Black blasting powder, 1914.			
	Coal mining.	Other mining.	Railway and other construction work.	All other purposes.	Coal mining.	Other mining.	Railway and other construction work.	All other purposes.
	Kegs.	*Kegs.*	*Kegs.*	*Kegs.*	*Kegs.*	*Kegs.*	*Kegs.*	*Kegs.*
Group 1. Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont	.....	892	362	26,940	.....	12	521	21,262
Group 2. Connecticut, New Jersey, and New York	.....	2,249	7,660	36,364	.....	2,900	2,311	34,337
Group 3. Delaware, District of Columbia, Maryland, and Virginia	124,239	2,000	46,746	47,933	103,250	1,359	20,934	22,436
Pennsylvania	2,535,098	19,596	74,359	214,290	2,477,542	16,237	68,063	158,708
West Virginia	614,392	5,000	11,115	38,377	566,602	6,304	20,375	18,446
Group 4. Florida, Georgia, North Carolina, and South Carolina	7,900	2,939	33,710	17,227	5,400	3,178	8,201	12,637
Group 5. Indiana and Kentucky	762,815	3,629	16,408	40,324	764,308	5,665	7,640	33,325
Illinois	1,209,974	828	1,175	22,305	1,195,026	5	533	10,072
Ohio	305,581	16,906	686	24,201	192,097	33,376	2,390	18,864
Group 6. Alabama, Mississippi, and Tennessee	315,942	12,022	55,213	88,581	247,327	18,608	26,043	14,959
Group 7. Michigan, Minnesota, and Wisconsin	21,421	191,908	2,426	8,846	28,999	140,150	2,708	10,633
Group 8. Iowa, Kansas, Missouri, and Nebraska	875,691	10,108	16,942	51,288	941,702	8,654	16,934	43,427
Group 9. Arkansas, Louisiana, Oklahoma, and Texas	309,390	2,297	20,035	28,996	294,177	5,593	7,855	22,259
Group 10. Montana, North Dakota, South Dakota, and Wyoming	161,082	2,280	35,462	34,319	158,270	2,550	14,209	32,250
Group 11. Colorado, New Mexico, and Utah	82,416	40,604	95,284	45,998	84,541	37,065	13,502	27,399
Group 12. Alaska, Idaho, Oregon, and Washington	9,940	60	51,886	48,932	13,115	3	29,303	31,854
Group 13. Arizona, California, and Nevada	802	20,786	157,005	65,489	.....	21,226	74,519	40,198
Total (kegs)	7,396,683	334,014	626,474	840,410	7,072,506	302,885	316,131	552,466
Grand total (kegs)	9,197,581				8,243,988			

TABLE 3.—*Amount of* ***high explosives*** *used in the United States during 1913 and 1914, classified by use.*

Groups of States.	High explosives other than permissible explosives, 1913.[a]				High explosives other than permissible explosives, 1914.			
	Coal mining.	Other mining.	Railway and other construction work.	All other purposes.	Coal mining.	Other mining.	Railway and other construction work.	All other purposes.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Group 1. Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont	.....	26,850	1,006,716	1,880,985	.....	35,100	904,814	1,670,681
Group 2. Connecticut, New Jersey, and New York	.....	2,205,428	6,207,383	6,992,453	.....	2,647,617	3,798,340	6,543,149
Group 3. Delaware, District of Columbia, Maryland, and Virginia	471,475	345,000	1,217,897	3,098,075	286,500	317,125	1,074,051	3,133,751
Pennsylvania	18,198,494	217,270	5,671,200	12,445,861	19,204,406	565,980	4,148,180	10,893,138
West Virginia	645,425	8,500	1,454,400	2,426,075	510,725	12,400	1,599,256	1,999,849
Group 4. Florida, Georgia, North Carolina, and South Carolina	5,680	327,585	1,537,722	3,648,556	2,800	409,235	1,244,755	3,304,685
Group 5. Indiana and Kentucky	699,201	57,400	1,594,900	3,788,208	208,734	31,425	889,129	3,708,630
Illinois	172,300	802,650	542,917	5,171,823	143,450	814,350	517,250	4,785,071
Ohio	62,360	378,625	300,750	5,530,388	547,700	325,750	217,900	7,724,605
Group 6. Alabama, Mississippi, and Tennessee	722,610	3,823,346	3,459,695	2,836,829	913,775	3,280,606	1,701,350	2,160,867
Group 7. Michigan, Minnesota, and Wisconsin	20,125	30,337,337	413,452	8,027,723	31,900	26,912,667	529,100	8,382,549
Group 8. Iowa, Kansas, Missouri, and Nebraska	1,430,550	13,089,350	503,610	6,168,136	1,076,450	11,645,412	829,395	5,982,109
Group 9. Arkansas, Louisiana, Oklahoma, and Texas	455,050	1,218,500	473,458	4,056,083	665,770	649,750	651,849	3,489,594
Group 10. Montana, North Dakota, South Dakota, and Wyoming	145,975	8,084,080	968,125	2,240,415	154,150	7,592,115	408,185	1,461,278
Group 11. Colorado, New Mexico, and Utah	615,670	7,975,945	1,307,380	5,538,450	243,760	6,381,865	500,105	5,211,747
Group 12. Alaska, Idaho, Oregon, and Washington	473,568	6,689,920	3,375,148	10,177,150	225,825	6,518,435	4,885,672	7,966,259
Group 13. Arizona, California, and Nevada	24,650	16,508,040	3,136,962	7,945,970	.....	16,127,745	4,104,615	3,891,481
Total (pounds)	24,143,133	92,096,426	33,173,805	92,973,180	24,215,945	84,264,577	27,983,946	81,989,503
Grand total (pounds)	242,386,544				218,453,971			

[a] Revised from statement in Technical Paper 85, Bureau of Mines.

TABLE 4.—*Amount of permissible explosives used in the United States during 1913 and 1914, classified by use.*

Groups of States.	Permissible explosives, 1913.					Permissible explosives, 1914.				
	Coal mining.	Other mining.	Railway and other construction work.	All other purposes.		Coal mining.	Other mining.	Railway and other construction work.	All other purposes.	
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*		*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	
Group 1. Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont		401,700	27,900	5,000			333,100		1,050	
Group 2. Connecticut, New Jersey, and New York		15,500	2,000	28,730			6,000	500	2,907	
Group 3. Delaware, District of Columbia, Maryland, and Virginia	134,000	35,500		19,650		444,525			74,075	
Pennsylvania	9,622,475	1,500	16,400	192,175		8,980,075		34,175	184,890	
West Virginia	3,282,560	20,000		195,900		2,993,449	21,550		241,100	
Group 4. Florida, Georgia, North Carolina, and South Carolina	482,260	1,850		8,150		564,525	900		4,430	
Group 5. Indiana and Kentucky	1,569,175	300	5,850	60,900		1,327,575	20,800		55,898	
Illinois	6,650			11,000		1,111,200	230		16,600	
Ohio	4,481,975	114,500		26,639		2,982,363	191,416	32,500	70,256	
Group 6. Alabama, Mississippi, and Tennessee		2,950		13,400			2,500		76,279	
Group 7. Michigan, Minnesota, and Wisconsin		114,500		70,344		15,387	279,730		45,150	
Group 8. Iowa, Kansas, Missouri, and Nebraska		471,800	200	76,775		398,787	25,600	750	17,880	
Group 9. Arkansas, Louisiana, Oklahoma, and Texas	21,125		1,525	9,200		261,850	30,600		7,800	
Group 10. Montana, North Dakota, South Dakota, and Wyoming	356,500	41,850	2,800	62,887		1,534,900	3,817,200	68,700	89,550	
Group 11. Colorado, New Mexico, and Utah	232,625	42,140	272,900			105,643	8,000		1,000	
Group 12. Alaska, Idaho, Oregon, and Washington	1,583,960	77,350	80,000	50			95,480	99,650	75	
Group 13. Arizona, California, and Nevada	507,660									
	45,400									
Total (pounds)	21,804,285	4,735,480	424,575	721,430		19,565,892	4,850,241	281,425	972,260	
Grand total (pounds)	27,686,770					25,697,818				

TABLE 5.— *Yearly sales of short-flame explosives used in coal mines in the United States, 1901–1914.*

Year.	Quantity sold.	Year.	Quantity sold.
	Pounds.		*Pounds.*
1901		1908	2,108,610
1902	11,300	1909	8,942,857
1903	288,661	1910	11,820,836
1904	608,270	1911	13,428,239
1905	1,031,300	1912	18,150,618
1906	1,533,575	1913	21,804,285
1907	2,095,244	1914	19,593,892

TABLE 6.—*Quantity of permissible explosives used in different coal fields in the United States, 1910–1914.*

Coal fields and regions.	1910	1911	1912	1913	1914
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
1. Pennsylvania anthracite field	1,486,100	1,917,412	2,177,172	3,294,225	4,380,635
2. Northern Appalachian region [a]	5,967,216	6,350,272	9,190,025	9,744,810	7,966,464
3. Southern Appalachian region	3,188,785	3,377,268	3,995,485	4,481,975	3,510,013
4. Eastern interior field	165,975	337,012	751,005	2,058,075	1,364,450
5. Western interior field	196,560	255,650	440,825	377,625	411,937
6. Rocky Mountain region	808,200	1,177,075	1,473,129	1,634,575	1,796,750
7. Pacific coast region	8,000	14,150	122,977	213,000	163,643
Total	11,820,836	13,428,239	18,150,618	21,804,285	19,593,892

[a] Not including Pennsylvania anthracite field.

TABLE 7.—*Coal-mine fatalities due to explosives during 1912, 1913, and 1914.*

States.	1912	1913	1914
Pennsylvania	83	79	97
West Virginia	6	8	5
Illinois	10	11	9
Ohio	6	6	2
Indiana, Michigan, and Kentucky	3	5	12
Alabama, Mississippi, Tennessee, Georgia, and North Carolina	5	2	2
Iowa, Kansas, and Missouri	5	6	4
Colorado, New Mexico, and Utah	1	7	4
Maryland and Virginia	10	2	
Montana, North Dakota, and Wyoming	2	4	4
Arkansas, Oklahoma, and Texas	1	5	4
Alaska, California, Idaho, Nevada, Oregon, and Washington	1	3	3
Total	133	138	146

TABLE 8.—*Fatalities in coal mines caused by explosives.*[a]

State.	Period.	Handling and transportation.	Handling caps, detonators, squibs, and fuse.	Thawing explosives.	Tamping.	Premature blast and short fuse.	Blown out or windy shot.	Flying pieces of rock or coal.	Returned too soon.	Delayed blast.	Shot breaking through pillar or rib.	Suffocation by powder gas.	Striking unexploded charge in removing débris.	Drilling into unexploded charge.	Miscellaneous.	Total.
Alabama	1894–1913	7			2	9	12	8	16	1	2	1			28	86
Arkansas	1905–1913														15	15
Colorado	1887–1912	2	2			18	3	4	2		1			9	7	56
Georgia	1900–1913											6			1	7
Illinois	1882–1912	86	1		10	95	81	48	52	3	32	7		14	25	454
Indiana	1891–1913	23			2	30	16	6	13	3	12	19		2	11	138
Iowa	1881–1912	17	1		1	20	4	26	5	1	4	1		3	2	80
Kansas	1898–1912	14	9			12	21	23	5		4	30			16	131
Kentucky	1884–1913	13	5			11	17	3	13	1	7	6		5	10	91
Maryland	1883–1913	3	1			6			1							6
Michigan	1900–1913					4		2	8	1	1	1		1	3	15
Missouri	1891–1913								5	2	5	8			4	45
Montana	1898–1913	3		1		4	5	1	3		4	1			3	15
New Mexico	1902–1912	2				1		5	1	2	1	1		2		21
North Dakota	1906–1913															3
Ohio	1870–1912	19	2			47	1	12	9	3	27	11			2	172
Oklahoma	1898–1912	16	1			9	19	14	10		6	6			42	111
Oregon	1903–1913														2	2
Pennsylvania (anthracite)	1870–1912	320	10		89	570	34	307	125	7	76	8	3	26	105	1,780
Pennsylvania (bituminous)	1877–1912	50	6	24	2	34	5	30	19	1	24	3		3	2	198
Tennessee	1902–1913	3		1		2		2	4		3	5			25	40
Texas	1909–1913														2	2
Utah	1892–1913	1				3		1								5
Virginia	1891–1913						1		1	2		15			10	10
Washington	1898–1913	2	2						7		1	1		3	3	32
West Virginia	1890–1912	54	4	2	3	22	6	2	6		9		1	1	29	147
Wyoming	1908–1912	1									1			2		12
Total		626	45	30	112	908	263	592	300	32	220	130	3	71	379	3,661
Percentage of total		17.37	1.22	0.82	3.06	24.80	6.55	16.17	8.19	0.88	6.01	3.55	0.48	1.94	10.35	100

[a] Compiled from the annual reports of the State mine inspectors.

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